Name of work:- Improvements to roads and drains and other developmental works in singanayakanahalli grama panchayathi limits under SWM head in Chief Minister Navanagarothana grants of Yelahanka Division (Package - 10)

Name of the Agency:-M/s Karthik Enterprises

Bill No:-II[nd] and Part Bill

Work Order No:- BBMP/EE/YNK D/EPMT-12/W.O/10/2020-21

Agreement No:- BBMP/EE/YNK.D/EPMT-12/AG/03/2020-21

Head of Account :

Tender approved Amount : Rs. 9,88,13,400.00

Job Code:- 003-20-000090

CERTIFICATE

BOQ Sl No	Description of the Item	Comments/Observation
1	KSRRB 300-1. Earthwork excavation by manual means for roads, drains & similar works in ordinary soil excavated surface levelled and sides neatly dressed, the disposed earth to be levelled neatly after breaking of clods complete as per specifications (I No-19.1.P No-111). 10km lead = (1.28x2x10)+57	Work done up to the billed quantity and quantity is satisfactory
2	KSRB 4-1.2 : Providing and laying in position plain cement concrete of Mix 1:3.6 with OPC @ 220kgs, with 40mm and down size graded granite metal coarse aggregates @0.892cum and fine aggregates @ 0.465cum machine mixed, machine mixed, concrete laid in layers not exceeding 15 cms. thick, well compacted, in foundation including cost of all materials, labour, HOM curing complete as per specifications. (P No-13,I No-4.2,KPWD SR 2018-19)	Work done up to the billed quantity and quantity is satisfactory
3	Providing and laying plain/reinforced cement concrete for side drains using M20 nominal mix concrete with OPC at 300 kgs. with 20mm and down size granite metal coarse aggregates at 0.69 cum and fine aggregates at 0.43 cum machine mixed, well compacted for walls and bottom including centering, shuttering, cost of materials, HOM of machinery, curing etc., complete excluding cost of steel as per MORTH specification No. 1500, 1700, 2200. including cost of materials, labour, HOM complete as per specificationsdo- Wall & bottom thickness 15cm (I No-37.59.2.P No-271.KPWD SR 2018-19)	Work done up to the billed quantity and quantity is satisfactory
	KSRRB M2200-6. Providing T.M.T. steel reinforcement for R.C.C. work including straightening, cutting, bending, hooking, placing in position, lapping and/or welding wherever required, tying with binding wire and anchoring to the adjoining members wherever necessary complete as per disign (laps, hooks and wastage shall not be measured and paid) cost of materials, labour, HOM complete as per specification. MORTH Specification No.1600 & 2200(I No-28.8.2,P No-229)	Work done up to the billed quantity and quantity is satisfactory

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BOQ Sl No	Description of the Item	Comments/Observation
5	Providing and laying 100mm thick pre-cast cover slabs over drains of width not exceeding 800 mm using M20 concrete reinforced with steel @ 6.00 kg/Sqm, slabs jointed in CM 1:3 proportion and nicely finished including providing holes in the Cover slabs wherever necessary for easy drainage of surface water including of labour, materials, HOM of machineries, curing, lead and lift charges etc, Complete as per MORTH specifications No. 1500, 1700. (P No-272 ,I No-37.66 of PWD BCSR 2018-19),	Work done up to the billed quantity and quantity is satisfactory
6	Providing and Fixing pre cast covering Slab made out of CC 1:2:4 with 10cm thick and Finishing cutting , including form work, cost of alll materials, labour,hire charges of machinery,loading,unloading,lead and lift,transportation etc ,copmplete. (Data Rate)	Work done up to the billed quantity and quantity is satisfactory
7	Providing and Fixing pre cast covering Slab 250mm thick made out of CC 1:2:4 and jelly 20mm Down size with steel reinforcement including form work,curing,including cost of alll materials, labour,hire charges of machinery, loading, unloading, lead and lift,transportation etc ,complete.As per Engineer incharge. (Data Rate)	Work done up to the billed quantity and quantity is satisfactory
8	KSRRB M300-14. Excavation for roadwork in all types of soil by mechanical means including cutting and loading to tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and transportation with a lead of 1.00 km and complete as per specifications MORTH Specificatio MORTH Specification No.301Loading and unloading with 10km lead= (I No-19.14,P No-143) 10km lead = (1.28x2x10)	Work done up to the billed quantity and quantity is satisfactory
9	KSRRB M200-24. Dismantling of cement concrete pavement by mechanical means using pneumatic tools, breaking to pieces not exceeding 0.02 cum in volume and stock piling at designated locations and disposal of dismantled materials upto a lead of 1000 metrers, stacking serviceable and unserviceable materials seperately complete as per specifications. MORTH Specification No. 202.(I No-18.47,P No-140) 10km lead = (1.28x2x10)	Work done up to the billed quantity and quantity is satisfactory

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BOQ Sl No	Description of the Item	Comments/Observation
10	KSRRB 300-58. **Compaction of original ground** by mechanical means including filling in depression occuring during rolling including cost of all labour, HOM complete as per specifications. MORTH / Chapter 3 (I No-19.64,P No-147)	Work done up to the billed quantity and quantity is satisfactory
11	KSRRB M600-1.Providing and **Constructing dry lean cement concrete mix** CC 1:5:10 base with OPC 25mm and down size graded granite metal coarse aggregate at 0.86cum and fine aggregates @0.58cum over a prepared sub-base, coarse and fine aggregate conforming to IS: 383-2016,aggregate cement ratio not to exceed 15:1, Aggregate gradation after blending to be as per Table 600-1,optimum moisture content to be determined during trial length construction, concrete strength not to be less than 10 Mpa at 7 days, mixed in a batching plant, transported to site, laid with a paver, compacting with 8-10 tonnes vibratory roller, finishing and curing complete as per specifications. Clause 601of MORTH V Revision and IS 456 Table-5. with OPC at 150 kg/cum and coarse aggregate .86cum, fine aggregate 0.58cum using Concrete Batch mix Plant at 75 cum/hr capacity with Slip form paver with electronic sensor. (I No-22.1,P No-174)	Work done up to the billed quantity and quantity is satisfactory
12	**Constructing un-reinforced, plain cement concrete for pavements using Grade concrete M30** over a prepared base with OPC coarse aggregate at 0.69 cum, fine aggregates at 0.46 cum,Coarse and fine aggregate conforming to IS:383-2016, with Superplastizer at 3 lts conforming to IS 9103-2008. mixed in a concrete mixer of not less than 0.6 cum capacity and appropriate weigh batcher as per approved mix design, laid in approved fixed side form work (steel channel, laying and fixing of 125 micron thick polythene film, wedges, steel plates including levelling the form work as per drawing). & Spreading the concrete with shovels, rackers compacted using needle, screed and plate vibrator and finished with floaters in a continuous operation including provision of contraction, expansion, construction and longitudinal joints,including groove cutting charges, joint filler, separation membrane of impermiable plastic sheet of 125 micron, sealant primer, joint sealant, admixtures as approved, curing compound, finishing to(P.No-176,I No-22.6.1)	Work done up to the billed quantity and quantity is satisfactory

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BOQ Sl No	Description of the Item	Comments/Observation
13	KSRRB M800-13.**Road Marking with Hot Applied Thermoplastic** Compound with Reflectrising Glass Beads on Bituminous Surface/ Concrete Surface: Providing and laying of hot applied thermoplastic compound 2.5 mm thick including reflectorising glass beads at 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC:35 standards specified. The finished surface to be level, uniform and free from streaks and holes complete as per specifications. MORTH Specification No. 803(P No-182,I No-24.15)	Work done up to the billed quantity and quantity is satisfactory
14	KSRRB M400-17. Providing, laying, spreading and compacting cushed stone aggregates of granite / trap / basalt to wet mix macadam specifications including pre mixing the material with water at OMC in mechanical mix plant carriage of mixed materials by tipper to site, laying in uniform layers with paver in sub-base/base course on well prepared surface and compacting with vibratory roller to achieve the desired density complete as per specifications(P.No-155,I No-20.18)	Work done up to the billed quantity and quantity is satisfactory
15	KSRRB M500-6. Providing and applying primer coat with S.S. bitumen emulsion on prepared surface of granular base such as WMM including cleaning of road surface and spraying primer at the rate of 0.60 kg / sqm using mechanical means complete as per specifications Clause 502 of MORTH V revision(P.No-158,I No-21.6)	Work done up to the billed quantity and quantity is satisfactory
16	KSRRB M500-17. Providing and laying dense graded bituminous macadam using crushed aggregates of specified grading, premixed with VG30 grade bituminous binder and, transporting the hot mix to work site, laying to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction in all respects complete as per specifications Clause 505 of MORTH V revisionusing 40/60 TPH capacity H.M.P. with Mechanical paver Gr-II (50 mm to 75 mm) with 4.5 % VG-30 Bitumen (P.No-160,I No-21.17.6)	Work done up to the billed quantity and quantity is satisfactory

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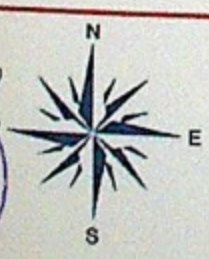

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BOQ Sl No	Description of the Item	Comments/Observation
17	KSRRB 500-7. Providing and applying tack coat using 80/100 grade bitumen(VG10) on the prepared black topped surfaces at 2.5 kg per 10 sqm, heating bitumen in boiler fitted with spray set (excluding cleaning of road surface) including cost of all materials, labour, HOM complete as per specifications (P.No-161,I No-21.7)	Work done up to the billed quantity and quantity is satisfactory
18	Providing and laying bituminous concrete 40mm thick with hot mix plant, using crushed aggregates of specified grading, premixed with bituminous binder and filler, transporting the hot mix to work site, laying with a paver finisher to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction in all respects complete as per specifications. Clause 507 of MORTH V revision as per IRC SP-53-2015. using 40-60 TPH capacity HMP with mechanical paver grading II (30-45mm) with 5.4 % of modified bituminus binder consisting of 4.97% of VG-30 bitumen (60/70 grade) and 0.43% of plastomeric thermoplastics (waste plastic)(P.No-171,I No-21.78.12)	Work done up to the billed quantity and quantity is satisfactory
19	Geophysical investigation of site for sinking Borewell for supplying drinking water to the habitation either through the Hand pump, MWS of P.W.S.S by vertical electrical sounding by adopting Venner or Schlumberger's method, including reconnaissance survey of geological formation, Gerophysical investigation of existing Ground Wate in the vicinity, its qualityf 1.0 meter in consolidated formation for proper seating of casing pipe, depth of drilling required to cover full depth of aquifer proposed to be tapped, probable yield and other information required including transportation of instrument and accessories to work site., engaging technical personal and labour required etc., as per Specification and direction (P.47, I. 9.4) PRED SR 2019-20	Work done up to the billed quantity and quantity is satisfactory

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BOQ Sl No	Description of the Item	Comments/Observation
20	Sinking borewell of 165 mm dia clear using super fast hydraulic rig of capacity 250 PSIG & above CFM & above in all strats including over burden upto 20 mts fixing of casing pipes, collars and cap with necessary cutting, throading and welding including transportation of rig and supporing vehicles, crew charges and cost of consumables etc., complete including yield testing at the final depth with a minimum working of compressor for one hour (excluding cost of casing pipes, collars, cap etc.,) Page no 46 / I. 9.1 PRED SR 2019-20	Work done up to the billed quantity and quantity is satisfactory
21	Supply of ISI mark 175 mm nominal bore medium black ERW casing pipe of 5 mm thick black electric resistance continuous welded mild steel tube material confirming to IS 1387 / 1993 & manufactured from hot rolled steel skelp / stripes in random length of 4 to 7 mts both ends threaded confirming to IS 554 / 1985, one end fixed with a socket and the other and with a plastic protection end (including of all taxes) SE PRED III NO 84	Work done up to the billed quantity and quantity is satisfactory
22	Providing and fixing in trenches galvanised / mild steel tubes (medium grade) 50mm dia nominal bore with all fittings (earth work in trenches to be measured and paid for separately) including cost of all materials, labour charges, HOM and testing complete as per specifications. Specification No KBS 13.2.14 / 13.6 (P. No.92/ I. No. 13.15 KPWD SR 2018-19)	Work done up to the billed quantity and quantity is satisfactory

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BOQ Sl No	Description of the Item	Comments/Observation
23	Providing 250mm dia PVC Pipe BWSSB SR 17-18 PNO 133 SL NO 1.11	Work done up to the billed quantity and quantity is satisfactory
24	Providing 175mm dia ms casing cap page no III it no 85 pred 12-13 sr	Work done up to the billed quantity and quantity is satisfactory
25	Supplying and drawing 3 core flat PVC sheathed submersible pump cable manufactured with electrolytic grade copper with flexible copper with low resistance conductor confirming to IS.8130-1984 and virgin grade PVC insulation and powder coating extruded PVC sheathed suitable for working voltage upto 1100Volts as per IS-694:1990. P. No. 7/ I No. (2.6.4) 3cx 6.0 Sqm KPWD Electrical SR 2019-20	Work done up to the billed quantity and quantity is satisfactory
26	Atalanta,Suguna,CRI KIRLOSKER AND other equipment pumps 15.00 HP/11KW(30 Stage)P. No. XLII I No.43) (K.P.W.D SR 2018-19)	Work done up to the billed quantity and quantity is satisfactory

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